CLAIMS LISTING:

1. -72. (cancelled).

73. (currently amended) A fiber optic network for carrying optical signals, comprising:

at least one optical fiber having embedded therein an optical signal comprising return-to-zero phase shift key (PSK) optical pulses;

at least one laser to generate a cw optical signal;

at least one pulse modulator to transform the cw optical signal into a pulsed optical signal; the pulse modulator having a bias and the drive voltage to form optical pulses selected to achieve maximal spectral efficiency of PSK transmission, the bias and the drive voltage of the pulse modulator selected to form optical pulses that mitigate non-linearities of the PSK transmission line and minimize adjacent channel crosstalk, the bias and the drive voltage of the pulse modulator are selected according to the characteristics of laser optical power, network channel spacing, the length, the dispersion, and non-linearities of the transmission network, the pulse modulator configured to use electro-optics to generate optical pulses using amplitude modulation of a cw optical signal, the optical pulses having a duration that is ½ or less that of the data bit rate;

at least one electro-optical data modulator to encode the data for transmission in the fiber optic network; and

a WDM combiner to combine multiple optical signals corresponding to multiple channels with arbitrary polarization states selected from at least one of, linear, circular, or elliptical.

74. (currently amended) The fiber optic network of claim 73, wherein the optical signal further comprises a plurality of non-return-to-zero PSK optical pulses formed by pulse modulator with optical pulses having bell-like shapes;

the optical pulses having a duration that is ½ or less that of the data bit rate;

wherein said non-return-to-zero optical pulses have arbitrary polarization states including but not limited to linear, circular, or elliptical.

75. (currently amended) The [method] network of claim 73, wherein the optical fiber has a zero dispersion wavelength of less than about 1500 nanometers.

76. (currently amended) The [method] <u>network</u> of claim 75, wherein the optical signal has a wavelength of between about 1500 nanometers and about 1625 nanometers.

77. (currently amended) The [method] <u>network</u> of claim 73, wherein a dispersion of the optical fiber is at least about +2 picoseconds per nanometer per kilometer at <u>or near</u> a wavelength of the optical signal.

78. (currently amended) The [method] <u>network</u> of claim 73, wherein a dispersion of the optical fiber is less than about -2 picoseconds per nanometer per kilometer at or near a wavelength of the optical signal.

79. (currently amended) The [method] <u>network</u> of claim 73, wherein the optical fiber is a non-zero-dispersion shifted fiber.

80. (currently amended) The [method] <u>network</u> of claim 73, wherein a dispersion of the optical fiber is at least about +15 picoseconds per nanometer per kilometer at or near a wavelength of the optical signal.

81. (currently amended) The [method] <u>network</u> of claim 73, wherein a dispersion of the optical fiber is less than about -15 picoseconds per nanometer per kilometer at <u>or near</u> a wavelength of the optical signal.

82. (currently amended) The [method] <u>network</u> of claim 73, wherein the optical fiber is single mode dispersion fiber having a zero dispersion wavelength of about 1310 nanometers.

83. (currently amended) The [method] <u>network</u> of claim ~~73~~ <u>74</u>, wherein an extinction ratio between adjacent pulses <u>in said non-return-to-zero</u> ~~of the~~ optical signal that have a relative phase difference of essentially zero is at least about 3 dB and less than about 8 dB.

84. (cancelled)

85. (currently amended) A method for optically transmitting data, comprising:

preparing a plurality of phase shift keyed (PSK) optical data streams, each PSK optical data stream having a different wavelength and encoding data from at least one respective data source;

combining the PSK optical data streams to prepare a wavelength division multiplexed (WDM) optical signal with an arbitrary polarization state selected from at least one of, linear, circular, or elliptical;

modulating an amplitude of the WDM optical signal to prepare a phase shift keyed wavelength division multiplex (PSKWDM) optical signal comprising a plurality of return-to-zero optical pulses with arbitrary polarization states selected from at least one of, linear, circular, or elliptical; said return-to-zero optical pulse shape selected to achieve maximal spectral efficiency, mitigate transmission line non-linearities, and adjacent channel crosstalk; the optical pulse shape selected according to the characteristics of laser optical power, network channel spacing, the length, the dispersion, and non-linearities of the transmission network;

transmitting the RZ-PSKWDM optical signal along an optical fiber of an optical fiber network.

86. (currently amended). The method of claim 85, wherein the PSKWDM optical signal further comprises

a plurality of non-return to zero optical pulses having bell-like shapes;

said non-return to zero optical pulses having arbitrary polarization states selected from at least one of, linear, circular, or elliptical;.

87. (currently amended) The method of claim 85, wherein each PSK optical data stream is a binary phase shift keyed BPSK optical data stream encoding data using a Mach-Zehnder modulator driven from a single respective data source.

88. (currently amended) The method of claim 85, wherein each PSK optical data stream is a quaternary phase shift keyed optical data stream encoding data using a quadrature modulator comprising two Mach-Zehnder modulators driven from a respective pair of data sources.

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89. (currently amended) The method of claim 85, wherein modulating an amplitude is performed after combining the PSK optical data streams <u>of the WDM channels</u>.

90. (currently amended) The method of claim 85, wherein preparing a plurality of PSK optical data streams <u>of the WDM channels</u> comprises modulating a phase of light provided by a cw light source.

91. (currently amended) The method of claim 85, wherein an extinction ratio between adjacent pulses <u>in said non-return-to-zero optical pulse streams within the WDM transmission link</u> ~~of a respective one of the optical pulse stream having~~ <u>haves</u> a relative phase difference of essentially zero is at least about 3 dB and less than about 8 dB.

92. (currently amended) The method of claim 91, wherein an extinction ratio between adjacent pulses <u>in said non-return-to-zero optical pulse streams within the WDM transmission link</u> ~~having~~ <u>haves</u> a relative phase difference of at least about ~~1/2~~ **π/2** is at least about 10 dB.

93. (currently amended) The method of claim 92, wherein an extinction ratio between adjacent pulses <u>in said non-return-to-zero optical pulse streams within the WDM transmission link</u> ~~of the optical pulse stream having~~ <u>haves</u> a relative phase difference of essentially zero is at least about 5 dB and less than about 8 dB.

94. (currently amended) The method of claim 93, wherein an extinction ratio between adjacent pulses <u>in said non-return-to-zero optical pulse streams within the WDM transmission link</u> ~~having~~ <u>haves</u> a relative phase difference of at least about ~~½~~ **π/2** is at least about 20 dB.

95. - 104. (cancelled).

Please add the following new claims:

105. (new) The network of claim 73, wherein the data modulator is a Mach-Zehnder modulator driven from a single respective data source.

106. (new) The network of claim 73, wherein the data modulator is quadrature modulator with first and second Mach-Zehnder modulators driven from a respective pair of data sources.

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